

## HOSPITAL RESPONSES TO MEDICARE'S PROSPECTIVE PAYMENT SYSTEM\*

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**D**IAGNOSIS Related Groups (DRGs) are a patient classification system—developed, in large part, from Professor Thompson's work—to facilitate utilization review and hospital management. However, the Health Care Financing Administration (HCFA) chose to use DRGs as a unit of payment in the Medicare Prospective Payment System (PPS). My talk today focuses on the effects of prospective payment on hospital behavior during its first year.<sup>1</sup> It is useful to remember that the DRG system is only a part of this and, in principle, a completely separate part. As the prospective payment system is designed, the Medicare program will ultimately pay all hospitals in the country the same rate for each patient in a particular classification—adjusted for urban/rural differences in cost, as well as legitimate differences in hospital costs related to area wages, whether hospitals provide medical education and

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whether hospitals have patients who are cost outliers.

When the Health Care Financing Administration decided to adopt the prospective payment system for hospitals, many people were concerned that the speed with which they were going to create and implement the policy would make it impossible to evaluate its effects. While Professor Thompson's use of trend data to identify the effects of the DRG system in Connecticut is informative, it is not conclusive. There remains a legitimate question whether the effects are those of Medicare prospective payment or the various other factors, such as new medical technologies and competitive pressures from health maintenance organizations that may also have been affecting hospital behavior.

Fortunately, from the policy evaluation perspective, Medicare prospective payment was implemented in a way that made an effective assessment of its impact possible. The reason is that hospitals were brought into it for the hospital's first full fiscal year beginning on or after October 1, 1983. Since hospitals do not all have the same fiscal year, some hospitals continued on the modified cost-based reimbursement system adopted under the tax equity and fiscal responsibility act (TEFRA). This makes it possible to test for prospective payment effects by comparing hospitals under PPS in 1984 with hospitals still under TEFRA in 1984.

TEFRA established a target rate per case for each hospital by applying an inflation factor to its base year (1981) cost per case, which was subject to a ceiling. A hospital that spent less than its target rate could keep 50% of the savings up to 5% of the target rate. A hospital exceeding its target rate would lose 75% of the excess. TEFRA therefore constrained rates of increase in Medicare payments but, by limiting rewards for cost control and penalties for cost growth, kept a tie between Medicare payments and current hospital costs.

When fully implemented, PPS will differ from TEFRA in two critical respects. First, it will use payment rates based on average cost per case across all hospitals. PPS, in essence, assumes that these averages represent the cost per case in economically efficient hospitals. Second, it places the full financial consequences of spending more or less than Medicare rates on the hospitals. In 1984 only one fourth of the PPS rate was based on average cost; the rest was based on the TEFRA rate. Unlike TEFRA, however, even in 1984 PPS set no limit on rewards or penalties. Comparing hospitals under PPS to hospitals under TEFRA, therefore, makes it possible to identify how the opportunity to earn a profit under PPS affects hospitals' behavior and financial status.

Since PPS does not establish a uniform degree of financial risk for all hospitals, it is also possible to estimate the effect of this differential pressure on hospital behavior. To make these comparisons we constructed a PPS impact index for hospitals in the prospective payment group to measure how the shift from cost reimbursement to prospective payment would affect a hospital's position if it made no changes in response to this.

The data we used for our analysis come from four mail surveys of hospitals conducted by the American Hospital Association. Two were special surveys asking for information on financial status and care to the poor, conducted in conjunction with The Urban Institute in 1982 and 1984. Our analysis used data from 827 hospitals that responded to both surveys and reported valid Medicare cost data in both years. Small rural hospitals were underrepresented and for-profit hospitals were excluded from analysis involving variables from these special surveys. The other two data sources were the AHA Annual Surveys for 1982 and 1984. We used annual survey data for just over 2,800 hospitals, representative of the universe of short-term, general, nonfederal hospitals. Hospitals' actual 1984 PPS payment rates were calculated from data provided by HCFA.

Our unit of analysis is the individual hospital, and our study involves making PPS/TEFRA comparisons in percentage changes for various measures of hospital care and finances between hospitals' 1982 and 1984 fiscal years. However, simple comparisons of percentage changes in use, expenses, and revenues between PPS and TEFRA hospitals may be influenced by factors other than whether the hospital was under the PPS or TEFRA system. Our analysis uses multivariate regressions to control for other factors affecting behavior, HMO enrollments, and physician supply. The regression results are reported as adjusted differences in the tables that follow.

While our study also looked at outpatient care, skilled nursing care, hospital management practices, and the provision of home health care, I limit my discussion here to hospitals' inpatient activities. The first year of prospective payment appears to have had little effect in these other areas but, as will become clear, inpatient care was immediately sensitive to such incentives.

Table I compares Medicare revenue per case and Medicare cost per case. From 1982 to 1984 Medicare revenues per case changed by about the same percentage for hospitals under PPS in their 1984 fiscal years as for hospitals under TEFRA in their 1984 fiscal year: 17.7% for TEFRA hospitals compared to 18.1% for PPS hospitals. What this tells us is that Medicare prospective

TABLE I. 1982 LEVELS AND 1982-84 PERCENTAGE CHANGES IN  
MEDICARE REVENUE PER CASE AND COST PER CASE  
BY TEFRA AND PPS

	<i>Medicare revenue per case</i>			<i>Medicare cost per case</i>		
	(N)	1982	Percent change 1982-84	(N)	1982	Percent change 1982-84
TEFRA	271	\$3,268	17.7	415	\$3,079	18.1
PPS (ALL)	276	3,092	18.5	412	3,038	7.6
Lowest quartile	77	3,178	9.6	116	3,058	3.2
2nd & 3rd quartiles	128	3,114	20.1	193	3,005	8.9
Highest quartile	71	2,957	25.5	103	3,002	10.2

Source: American Hospital Association: *Survey of Hospitals' Financial Status and Care to the Poor*, 1982-1984.

payment is not affecting hospital behavior by constraining the growth in revenues per case.

In contrast to this conspicuous similarity, however, Medicare cost per case increased by less than half as much for hospitals under PPS as for hospitals still under TEFRA. TEFRA hospitals had rates of increase in cost per case that were approximately equal to their rate of increase in revenues. The PPS hospitals, with the incentive to retain any profits that they earn by incurring lower costs, were able to restrain Medicare costs per case to a growth rate of 7.6% from 1982 to 1984. The difference rather dramatically highlights what the profit incentive can do. It is all the more remarkable when we remember that 1984 was a year when prospective payment was clearly in transition. The first year rates, still based 75% on hospitals' historical costs, were not national rates in any sense of the word. Even so, the profit incentive resulted in a dramatic decrease in the rate of growth in Medicare costs per case.

Now look at the differences among the hospitals on PPS according to the relative financial pressure placed on them by the new system. The lowest quartile faced the greatest pressure, the highest quartile the least. Those PPS hospitals with the lowest rate of increases in Medicare revenue per case had the lowest rate of increase in Medicare cost per case. However, all three groups had rates of Medicare cost increase that were less than half the rate of increase of their Medicare revenue per case. This demonstrates fairly clearly that the degree of cost control is related to the potential for making a profit, irrespective of the degree of financial pressure.

How did hospitals under PPS achieve these savings? Table II explores the answer, showing effects on admissions, length of stay, and inpatient days.

TABLE II. 1982–1984 CHANGES IN INPATIENT HOSPITAL CARE  
BY PPS AND TEFRA

	PPS		TEFRA		Adjusted difference
	1982	Percent change 1982–84	1982	Percent change 1982–84	
Admissions					
Medicare	2,102	-0.4%	2,228	3.4%	-3.8 <sup>c</sup>
Other	4,596	-9.6	4,985	-8.5	-0.8
Length of stay (Days)					
Medicare	8.8	-14.6	9.1	-7.9	-6.5 <sup>c</sup>
Other	5.1	-5.4	5.3	-3.5	2.0 <sup>c</sup>
Inpatient days					
Medicare	20,164	-15.2	22,171	-5.3	-9.8 <sup>c</sup>
Other	26,091	-14.8	29,647	-12.1	-2.6 <sup>c</sup>
	(n = 1,287)		(n = 1,532)		

Source: American Hospital Association: *Annual Survey of Hospitals*. 1982 and 1984.

Notes: a) Significantly different from zero at ten percent level  
b) Significantly different from zero at five percent level  
c) Significantly different from zero at one percent level

Let us look first at admissions. Hospitals under PPS cut their admissions by 0.4% between 1982 and 1984. TEFRA hospitals, in contrast, increased them by 3.4%. The statistically significant difference indicates that PPS hospitals cut admissions relative to TEFRA hospitals. Length of stay and inpatient days show similar patterns.

Part of the relative drop in admissions is due to changes in the use of ambulatory surgery in PPS hospitals. Hospitals under PPS increased their use of ambulatory surgery significantly more than did TEFRA hospitals. But there are two other plausible explanations as well. The first has to do with the DRG payment system. Under cost-based reimbursement, hospitals have no incentive to turn away any Medicare patients. Under PPS, hospitals may well find that there are some DRGs on which they make money and some on which they do not. If the latter category is now less likely to be admitted, fewer admissions would be expected under PPS than TEFRA. The second, suggested to us by HCFA staff, is that the Peer Review Organizations (PROs) really did have a big effect, and that the utilization review standards they implemented did cause hospitals not to admit some patients.

Prospective payment hospitals had bigger reductions in both length of stay and inpatient days than TEFRA hospitals between 1982 and 1984. Within the PPS group (not shown in Table II), the degree of financial pressure was

related to reductions in Medicare length of stay and inpatient days, with the more pressured hospitals having the biggest reductions. The pattern across PPS index groups is less clear for admissions.

We now contrast these Medicare patterns with the patterns for non-Medicare patients, also shown in Table II. As can be seen, there seems to be some spillover effect of PPS for length of stay and inpatient days, though the impact on other patients is much less substantial than that observed for Medicare.

Table III allows us to explore how these Medicare payment policies may be showing up in overall hospital performance indicators. Total hospital expenses grew significantly more slowly in PPS hospitals than in TEFRA hospitals; that difference was primarily due to hospitals in the low and middle group of the PPS impact index. Hospitals that were in the high group, those least likely to be adversely affected by PPS, were no different from TEFRA hospitals in terms of their rate of growth in overall costs. This suggests that the cost-containment activity of these hospitals—although apparent given the length of stay and the Medicare cost-per-case differentials—was not as dramatically different from TEFRA hospitals as that observed for other PPS hospitals.

Now, looking at the other performance indicators in the table, we see that the group with greatest financial pressure was more aggressive than the other PPS groups in reducing the numbers of beds and hospital staff. There is an across-the-board staffing reduction going on in the hospital industry nationally; but that reduction is differentially greater among hospitals that would have been most adversely affected had they done nothing in response to PPS. Finally, all PPS hospitals sought to contain the growth of salaries compared with the TEFRA hospitals, but fiscal pressure did not seem to affect the degree of cost containment in this area.

Did the new payment system and these hospital responses result in the improved financial margins? Table IV indicates that they did. In 1982 both hospitals that stayed on TEFRA in 1984 and those that went on PPS had very similar margins: 5.5% for TEFRA hospitals and 4.9% for PPS hospitals. Between 1982 and 1984 TEFRA hospital margins remained about constant. However, PPS led to statistically significant increases in financial margins. PPS hospital margins increased by 3.0% over this time period, indicating that the cost-containment activities and the PPS payment system overall led to increased hospital profitability.

Now look at the impact of PPS on profitability for hospitals with different degrees of financial pressure. We consider this result somewhat troubling.

TABLE III. 1982-84 CHANGES IN OVERALL HOSPITAL ACTIVITIES BY TEFRA, PPS, AND PPS IMPACT GROUPS

	TEFRA	All	PPS		
			Lowest quartile	2nd & 3rd quartiles	Highest quartile
Total expenses					
Percent change, 1982-84	15.6%	12.9%	10.8%	12.8%	15.5%
Adjusted difference		-2.7 <sup>c</sup>	-5.3 <sup>c</sup>	-2.4 <sup>c</sup>	0.8
Total Beds					
Percent change, 1982-84	0.3	-0.3	-1.8	0.1	0.6
Adjusted difference		0.7 <sup>b</sup>	-2.0 <sup>c</sup>	-0.3	-0.4
Total FTEs					
Percent change, 1982-84	-7.5	-8.2	-10.2	-8.2	-6.0
Adjusted difference		-0.6	-2.4 <sup>c</sup>	-0.6	1.0
Average salary per FTE					
Percent change, 1982-84	23.7	21.3	21.5	21.1	21.6
Adjusted difference		-2.1 <sup>c</sup>	-2.4 <sup>c</sup>	-2.2 <sup>c</sup>	-1.8 <sup>a</sup>
N	1,437	1,229	311	602	306

Source: American Hospital Association: *Annual Survey of Hospitals*, 1982 and 1984.

Notes: a) Significantly different from zero at 10% level

b) Significantly different from zero at 5% level

c) Significantly different from zero at 1% level

Despite all the cost containment activity—in terms of reducing Medicare costs, total costs, beds, and staff undertaken by hospitals in the lowest quartile group—they ended up unable to improve their margins by as much as hospitals in the highest group. The hospitals in the low group had an increase in their margins of about 2%, whereas hospitals in the highest quartile of the index had increases in margins of 3.6%. This suggests that something in the PPS rate structure led to these differential rates of growth in profit. If there is something in the PPS payment system that rewards certain hospitals more than others without regard to their behavioral responses, it is legitimate to raise questions about the financial incentives of the system.

Does our analysis point to any ways of modifying Medicare PPS that would maintain its obviously strong cost-containment incentives while improving payment rate equity across hospitals or reducing Medicare outlays? Or, to put it another way, should we necessarily want hospitals that had lower historical costs to be paid *more*? We certainly can argue that such a system rewards those hospitals that historically have been more efficient, but that is

TABLE IV  
1982–84 CHANGES IN FINANCIAL MARGINS  
BY TEFRA, PPS, AND PPS IMPACT GROUPS

Percent total margin	TEFRA	PPS			
		All	Lowest quartile	2nd & 3rd quartiles	Highest quartile
1982 Level	5.5%	4.9%	5.4%	4.8%	4.5%
Absolute change, 1982–84	−0.2	2.8	2.0	3.0	3.6
Adjusted difference		3.0 <sup>c</sup>	2.6 <sup>c</sup>	3.1 <sup>c</sup>	3.2 <sup>c</sup>
N	391	381	113	179	89

Source: American Hospital Association: *Survey of Hospitals' Financial Status and Care to the Poor*. 1982 and 1984.

Notes: a) Significantly different from zero at ten percent level.

b) Significantly different from zero at five percent level

c) Significantly different from zero at one percent level

not precisely the policy issue. The real issue is whether or not the Medicare program benefits from creating that type of system.

Clearly not all hospitals should receive the same rate for a particular type of Medicare case. There are legitimate reasons for cost difference that are recognized in the interest of equity. Essentially, Medicare PPS creates this type of equity across hospitals by adjusting federal average rates to take into account differences in costs due to rural/urban status, area wages, medical education costs, and outlier cases, and—though not included in this first year—the proportion of indigent care provided. That type of payment rate equity really is not dependent on being a DRG system at all. It is really a matter of determining prospective rates nationally and then adjusting them to take into account legitimate differences. The efficiency incentive, as I said, is established by providing hospitals with the opportunity to earn profits by incurring costs below the prospectively set rates.

Our findings with respect to hospital margins suggest that PPS has provided windfalls to certain types of hospitals. Certain hospitals are getting very high rates under this payment system relative to their own costs. The extent of these windfalls can be measured by comparing hospitals' PPS payments relative to their own base year costs.

Table V provides three alternative measures of these windfalls; all control for case mix differences across hospitals. The top line shows the actual 1984 PPS payment rate (75% hospital-specific, 25% federal) relative to base-year costs. As can be seen, hospitals in the low quartile received rates about 14% higher than base-year (1981) costs. Hospitals in the high quartile received



TABLE V. RATIO OF PPS PAYMENT RATE TO BASE-YEAR COST PER CASE.  
BY PPS IMPACT INDEX QUANTILES

<i>PPS payment rate (PERCENT)</i> <i>Hospital Specific/Percent Federal)</i>	<i>PPS impact index quartiles</i>		
	<i>First</i>	<i>Second And Third</i>	<i>Fourth</i>
Actual rate (75/25)	1.14	1.17	1.20
Fully hospital specific (100/0)	1.13	1.13	1.13
Fully federal (0/100)	1.16	1.28	1.40

Source: Health Care Financing Administration, unpublished data.  
Notes: a) The first quartile of the impact index is the group hypothesized to have faced the greatest potential adverse financial impact from PPS; the fourth quartile is hypothesized to have faced the least potential adverse financial impact.

rates about 20% higher. Therefore, relative to their own base-year costs, hospitals least likely to be adversely affected by PPS appear to be receiving a windfall when compared to the low group. The top line of this table is not really surprising. We would expect this kind of differential, because the comparison between the payment rate and historical or base-year cost is pretty much what we had built into the computation of our index of relative financial pressure. So this is just another way to look at the index.

The next two rows in the table help us to explore where this windfall is coming from. The second row shows what would have happened if PPS hospital rates have been based entirely on hospital-specific historical cost; all hospitals would have received approximately the same rate relative to their costs—a basic trending of those costs forward. In all cases those payments would have been about 13% above the base-year cost. The low group would have been in about the same position as it actually was, but the other two groups would have received lower payments, in fact, under this system relative to the actual PPS system.

The third row shows what the situation would have been if the system were 100% federal—if there had been no hospital-specific transition elements built into it. Again, the low group would have received almost the same rate as the actual rate, about 16% above their costs. But the high group would have received rates 40% above their historical costs.

These data show clearly that any windfalls accruing to the high index hospitals were created solely by the federal component in the rate. One can conclude from this that the adjustments that the system includes to take into account—legitimate variations in costs across hospitals—are somehow overly generous relative to historical costs for certain types of hospitals. Moreover, a PPS structure based fully on federal rates—and this is what is

ultimately planned by HCFA—will create even greater payment disparities than those observed for 1984, the first year. This leads us to a conclusion regarding a potential modification of PPS that might make it a better policy, in the sense that its incentives would be retained but its costs would be lowered. Before I discuss this, however, let me briefly review the overall findings of the study.

There are two major findings of our study. First, PPS and the profit opportunity it provides hospitals did encourage cost containment. It is worth noting that the differences we saw between PPS and TEFRA hospitals in 1984 makes it clear that using aggregate trend data to measure the impact of PPS, especially in this first year, is inappropriate. Furthermore, even treating all PPS hospitals as a single group obscures differential responses to the payment policy. Whether or not these cost-containment activities led to adverse impacts on quality of care is an area that we did not cover but should certainly be addressed in future research.

The second important finding is that the federal component of the PPS payment rate gives windfalls to some hospitals which, in consequence, make more modest efforts at cost containment. In other words, cost containment is a function of both the opportunity to earn a profit, regardless of how tightly rates are constrained *and* the level at which PPS payment rates exceed a hospital's base year costs.

In 1984 PPS stimulated more cost containment than TEFRA by allowing hospitals to keep any difference between the Medicare rate and their costs. Our findings indicate that this incentive can be maintained by basing rates entirely on each hospital's cost experience in an initial year (say, 1984) and trending rates forward annually in the same way PPS rates are currently trended. The degree of cost constraint can be determined by the trend factor. The advantages of such a system are several. First, it eliminates the need to adjust rates based on average cost to reflect hard-to-measure but real differences in the nature of care hospitals provide. Second, it allows Medicare to spend less to achieve an equivalent impact on hospital costs; hospital-specific rates offer incentives for cost reduction *without* paying windfalls to some institutions. Third, it allows policymakers to set rates as tightly or generously, relative to base-year costs, as they wish; rates of increase still would not be a function of hospitals' current spending behavior.

Public attention has focused so heavily on the redistributive aspects of PPS that the importance of its profit incentives has been overlooked. Reviewing actual experience allows us to reevaluate what PPS actually does and to learn from its strengths as well as its weaknesses.

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